

REMARKS

Reconsideration and allowance of the subject application in view of the foregoing amendments and the following remarks is respectfully requested.

By this Amendment, claims 1-4, 7, 9-15, and 19-24 are amended, and claims 5, 6, 8, 16, and 17 are canceled without prejudice or disclaimer. Accordingly, claims 1-4, 7, 9-15, and 18-24 are pending in this application.

Rejections under 35 U.S.C. §112

Claims 1-22 stand rejected under 35 U.S.C. §112, second paragraph, the Office Action indicating that the claims are indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicants regard as the invention.

More specifically, claims 1, 3, 5, 12, 14, and 16 stand rejected as reciting features for which there is insufficient antecedent basis. The claims are amended variously to obviate the rejections thereto.

In view of the foregoing amendments, Applicants respectfully submit that all pending claims fully complies with 35 U.S.C. §112, second paragraph. Accordingly, withdrawal of the rejection is respectfully requested.

Rejections under 35 U.S.C. §103

Claims 1-24 stand rejected under 35 USC 103(a) over Hakenburg et al. (US 6,792,470) in view of Cooper et al. (US 20020044531).

In response, as presented below, amended and unamended claims are believed to be patentable over Hakenburg and Cooper for the failure of the applied art to not only disclose, teach or suggest all of Applicants' recited claim features, but in addition fails to present any apparent reason to combine references or modify prior art to create the Applicants' allegedly obvious claim elements.

The Patent and Trademark Office (PTO) alleges that Hakenburg, in the abstract and at column 4, lines 54-67; column 5, lines 1-8; and Fig. 2, discloses estimating, at the transmitter,

the multimedia data played at the receiver using negative acknowledgements (NACKs) or multipurpose acknowledgments (MACKs) from the receiver. The PTO admits that Hakenburg fails to disclose estimating, at the transmitter, data at a receiver using information received from the receiver, and measuring, at the transmitter, the transmission quality of the data received by the receiver by comparing the estimated received data with reference data. The PTO relies on Cooper to remedy the deficiencies of Hakenburg, alleging that Cooper discloses estimating, at the transmitter, data at a receiver using information received by the receiver. Applicants respectfully disagree.

Applicants submit that the applied references merely relate to measuring the channel state between a transmitter and a receiver, but fail to disclose, teach, or suggest wherein the transmitter measures quality of multimedia data received by the receiver.

More specifically, although Hakenburg appears to disclose a system using prioritized frames to determine whether to transmit a frame that generated a return NACK, nowhere does Hakenburg perform an analysis that includes estimating the multimedia data received at the receiver using reference data. Applicants respectfully submit that retransmitting a frame based upon a received NACK and a priority assigned to the frame that resulted in the NACK does not render obvious the claimed estimating of the multimedia data received by the receiver.

Still further, Cooper appears to only disclose generating an Internet Control Message Protocol (ICMP) echo request that includes a primary station transmitting a message to a secondary station that is repeated back to the primary station. The primary station measures a bit slicer error of the ICMP echo reply using the original message and characterizes the channel quality as a function of the bit slicer error. Nowhere does Cooper estimate the data received by the receiver, because unlike the claimed apparatus and method, which only returns transmission error information and not the entire message, Cooper echoes back the entire message.

Although the approach taken by Cooper may be satisfactory for intermittent channel checking that echoes back a short data pattern imbedded in an ICMP echo request, one of ordinary skill in the art would not be motivated to echo back the entire transmitted multimedia data, nor would one of ordinary skill in the art be motivated, based on either Hakenburg or Cooper, to transmit back only the transmission errors.

Moreover, Applicants respectfully submit that the asserted combination of references present no apparent reason to combine references or modify prior art to create the Applicants' allegedly obvious claim elements.

Regarding amended independent claims 1, 12 and 24, Hakenburg appears to disclose wherein a missing frame data is retransmitted if its priority level is greater than the priority threshold value. Cooper, however, appears to only disclose a method for determining communication channel quality using ICMP. Applicants respectfully submit, however, that the combined use of Hakenburg and Cooper is incapable of estimating the multimedia data received by the receiver. For example, transmission errors can cause a variety of visual impairments, including, for example, skipped frames, lost blocks, freezed frames, jitters, delays, etc. All these impairments produce different levels of perceptual video quality.

In order to accurately estimate the video quality of the received video at the transmitter, the transmitter must be able to accurately reconstruct the multimedia data received and played at the receiver. Applicants' claimed apparatus and method is distinguished over the asserted combination of Hakenburg and Cooper in that embodiments of the claimed invention accurately reconstruct the multimedia data at the transmitter using the transmission error information. Applicants respectfully submit that based upon any allowable combination of Hakenburg and Cooper, it is impossible for the transmitter to know what kinds of impairments are experienced by the transmission errors. Thus, it is not possible to reconstruct, at the transmitter, the multimedia data at the receiver since the transmitter never knows the type of errors occurring in Hakenburg or Cooper. Consequently, the transmitters of Hakenburg and Cooper cannot accurately measure the transmission quality of the multimedia data received by the receiver.

Regarding amended independent claims 23 and 24, Applicants' claimed method and apparatus extracts a set of parameters from a video segment affected by transmission errors and transmits the set of parameters to the transmitter. As explained previously, transmission errors can cause a variety of visual impairments and the set of parameters reflects these impairments. Nowhere does Hakenburg suggest transmitting the claimed parameter set. Furthermore, as explained above, the asserted combination of Hakenburg and Cooper fails to disclose, and indeed, is incapable of estimating the multimedia data received by the receiver.

Therefore, based upon the above, Applicants respectfully submit that amended independent claims 1, 12, 23, and 24 are patentable not only due to the failure of the applied references to disclose, teach or motivate all recited features of the claims, but are also patentable based upon the improper combination of Hakenburg and Cooper. The pending claims that depend from these independent claims are likewise patentable over the asserted combination of references for at least their dependence on an allowable base claim, as well as for the additional features they recite.

Regarding claim 2 or example, nowhere does Hakenburg disclose transmitting error information only when a transmission error of the transmitted multimedia data is detected. Consequently, Hakenburg is incapable of reconstructing, at the transmitter, the multimedia data received at the receiver.

Regarding amended claims 3-4 and 14-15, Hakenburg fails to suggest transmitting information on error concealment techniques. Error concealment techniques are used to partly reconstruct lost blocks due to transmission errors from the pixels of adjacent frames during the decoding process. Nowhere does Hakenburg teach the use of these error concealment techniques.

Based upon the foregoing, withdrawal of the 103(a) rejection over Hakenburg and Cooper is respectfully requested.

Conclusion

All objections and rejections having been addressed, it is respectfully submitted that the present application should be in condition for allowance and a Notice to that effect is earnestly solicited. Early issuance of a Notice of Allowance is courteously solicited.

The Examiner is invited to telephone the undersigned, Applicants' attorney of record, to facilitate advancement of the present application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

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